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AGRICULTURAL ENGINEERING

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October, 1932.

Irrigation Principles and Practices.
Wiley and Sons, 1932. 422p.

By Orson W. Israelsen.

N. Y., John

This book is intended primarily "to meet the needs of college and university students who seek information concerning the aspects of irrigation which are not considered in works on irrigation engineering." It should also be of value to officials and employees of irrigation organizations, irrigation engineers, and leaders in irrigation affairs. The author has endeavored to clarify the principles on which to build a permanently profitable agriculture under irrigation and the improvement of irrigation practices. The progress made along these lines, he believes, is due largely to the achievements of public irrigation research agencies.

Some of the basic principles of hydraulics, including flow of water and measurement of water, are treated briefly. One chapter is devoted to the subject of pumping water for irrigation; one to the various methods of applying water, classified as flooding, furrow subirrigation and spraying; and another to farm irrigation implements and structures. Six chapters are concerned with soils including a discussion of soil properties, soil and water relations, storage and movement of water in soils, alkali soils, and evaporation and transpiration. The time of irrigation, consumptive use of water, relation of crop yield to water consumed, social and administrative aspects of irrigation, amounts of water used in irrigation, and efficiency and economy in irrigation are treated in the order given. Four chapters are devoted to the irrigation of various standard crops, cereals, alfalfa, sugar beets, potatoes, and orchards and one deals with irrigation in humid climates.

In the concluding chapter "The Problems of Irrigation," the author points out that "the problems of irrigation in an arid region are not to be solved by engineers alone - they require also the wisdom of great statesmen, legislators, attorneys, economists, sociologists and learned men in the several branches of agricultural science."

A list of references is given at the end of each chapter and a number of problems and questions for classroom use are presented in the appendix.

Agricultural Engineering.

Logical future development of research in agricultural engineering. By R.W. Trullinger. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 227-229. Future research in agricultural engineering will be highly coordinated undertaking between engineers and commodity groups of agricultural scientists; between local, regional and national bodies; between public and private interests.

Some of the economic aspects of an engineered agriculture. By M.L. Wilson. Agricultural Engineering. v. 13, no. 10. October, 1932. p. 255-258. Engineered agriculture will require new type of engineering - farm management research and experimentation. As new machines and new processes are developed, we can assume that they will either adjust themselves to prevailing organization, size and type of farm or farm organization and size will be adjusted to new techniques and equipment.

Agriculture.

Back to the farm: Editorial. California Cultivator. v. 79, no. 9. August 27, 1932. p. 130. Most of those who now want to get on farm are little interested in commercial aspect of farming.

Back to the farm: Editorial. American Fertilizer. v. 77, no. 3. July 30, 1932. p. 12-13. Only land available is that which was overcropped until it would no longer yield reasonable harvest, or marginal land which never had been worked profitably. At best movement is temporary one. There will be fewer workers on farms and fewer acres farmed ten years hence than at present time. No matter how desperate one's condition may be in time of serious depression, it is rarely bettered by going somewhere else.

Present-day agriculture in Arizona. By the staff. 1932. 40p. Arizona. Agricultural Experiment Station. Bulletin no. 141. Irrigation: p. 7-9.

This year's crops may bring business turn. By George L. Adamson. Magazine of Wall Street. v. 50, no. 8. August 6, 1932. p. 442-444, 478. Further improvement in farmer's position means increased power and general boost to entire commodity list.

Ups and downs of agriculture. By Charles J. Brand. American Fertilizer. v. 77, no. 1. July 2, 1932. p. 11, 28-32. Over production and under consumption; slow farm turnover; tariff and farm problem; disposal of agricultural surpluses; national land utilization policy.

Air Conditioning.

Air conditioning and building design. Architectural Record. v. 72, no. 4. October, 1932. p. 277-280. Air distribution; heat losses; wind movements; streamlining; windows and wall construction.

Air conditioning and the humble hen egg. By Thos. H. Hart. Pt. III. Aerologist. v. 8, no. 10. October, 1932. p. 17-19. Air conditions for mature chickens. Chicken comfort zone.

Air Conditioning. (Cont'd)

- Air conditioning equipment. By C. Theodore Larson. Architectural Record. v. 72, no. 4. October, 1932. p. 260-271. Central systems in domestic air conditioning; Decentralized unit conditions; Checklist of equipment for all year air conditioning.
- Air infiltration through steel framed windows. By D. O. Rusk, V. H. Cherry and L. Boelter. Heating, Piping and Air Conditioning. v. 4, no. 6. June, 1932. p. 696-700.
- Air supply, distribution and exhaust systems. By S. R. Lewis. Heating, Piping and Air Conditioning. v. 4, no. 6. June, 1932. p. 691-695.
- Clients will demand air conditioning. By Esten Bolling. American Architect. v. 141, no. 2607. May, 1932. p. 44-45, 117.
- How to use the effective temperature index and comfort charts. Heating, Piping and Air Conditioning. v. 4, no. 6. June, 1932. p. 433-437. Report on true significance and limitations of charts prepared by Technical Advisory Committee on re-study.
- Ice - Design, installation and operation of home cooling job. By G.B. Helmrich. Domestic Engineering. v. 140, no. 3. August, 1932. p. 43-47. Complete working data given on one phase of air conditioning.
- Measuring air conditioning. By E. V. Hill. Aerologist. v. 8, no. 10. October, 1932. p. 9-15, 25.
- Methods of air conditioning. Architectural Record. v. 72, no. 4. October, 1932. p. 272-276. Humidification; Dehumidification; Cooling; Heating; Air cleaning; Ionization.
- Water coolers for air-conditioning systems using ice. By Clifford F. Holske. Heating, Piping and Air Conditioning. v. 4, no. 6. June, 1932. p. 405-406. Describes construction of typical ice bunkers for air-conditioning systems using blocks of ice as cooling medium. Details of bunkers in various installations are shown.
- What does air conditioning include? Domestic Engineering. v. 140, no. 3. August, 1932. p. 42. Outline based on definition that air conditioning is simultaneous control of (1) temperature; (2) moisture content; (3) movement; (4) distribution and (5) cleanliness of air within very definite enclosure.

Associations.

- American society for testing materials: Society tenders report on new projects in progress or contemplated. Commercial Standards Monthly. v. 9, no. 3. September, 1932. p. 57-58.

Belts.

- Action of gravity on belts - the Lewis effect. Mechanical Engineering. v. 54, no. 10. October, 1932. p. 720-723.

Belts. (Cont'd)

Proper tension lengthens life on belts. By J. N. Smith. Industrial Power. v. 23, no. 4. October, 1932. p. 34-38, 61. Regardless of type of drive or kind of belt used, amount of power transmitted by any belt is proportionate to (1) tension of belt and (2) coefficient of friction between belt and pulleys.

Building construction.

Architectural graphic standards for architects, engineers, decorators, builders and draftsmen. By Charles George Ramsey and Harold Reeve Sleeper. N.Y. John Wiley & Sons, Inc., 1932. 233p.

Bureau of the Census reports on construction. Engineering News Record. v. 109, no. 11. September 15, 1932. p. 321. Analysis of construction industry based on reports of 144,396 contractors who reported 1929 business of \$7,300,000,000.

Comparative details - Group 1. Dormers. Pencil Points. v. 13, no. 10. October, 1932. p. 695-701.

Delay in planning buildings now means extra cost. By M. D. Eams and W. S. Wolfe. Engineering News Record. v. 109, no. 13. September 29, 1932. p. 374-375. Evidence of bottom in building costs warns owners that delay in planning construction will require heavier investments for needed improvements.

Plumbing system for the house. By Arthur Bates Lincoln. Pencil Points. v. 13, no. 9. September, 1932. p. 621-623. Water supply; sewer connection; main soil stack; house trap; materials for pipe; plumbing section.

Reinforced masonry found no costlier than brick veneer. By Chas. H. Fork. Building Economy. v. 8, no. 5. September - October, 1932. p. 6-9. Tables give cost analysis of 8-inch hollow reinforced brick basement wall, wall above first floor and brick veneer wall.

Cotton.

Making cotton cheaper. Can present production costs be reduced? By M.G. Vaiden, J. O. Smith, W. E. Ayres. 1932. 15p. Mississippi. Agricultural Experiment Station. Bulletin no. 298.

Quality cotton ginning: Editorial. Cotton and Cotton Oil News. v. 33, no. 38. September 17, 1932. p. 5. Refers to instructive comment on findings of Texas Agricultural Experiment Station experiments with respect to cotton ginning.

Dams.

Construction joints of Pardee Dam grouted a second time. By F. W. Hanna. Engineering News Record. v. 109, no. 15. October 13, 1932. p. 431.

Grand Coulee dam a giant. By Ivan C. Crawford. Idaho Farmer. v. 50, no. 7. August 18, 1932. p. 6. 450 feet high, four-fifths of mile long. Considering only irrigation development, government engineers have placed cost of Columbia basin project at approximately \$173 per acre. This figure represents only cost of bringing water to edge of each 160 acre tract.

Notes on abutment sluicing at St. Gabriel dam no. 2. By E. C. Eaton. Engineering News Record. v. 109, no. 11. September 15, 1932. p. 311. Where slopes are steep enough to permit of sluicing, it constitutes ideal method for exploration and exposure of geological formations.

Drainage.

Mole draining. 1932. 4p. Gt. Britain. Ministry of Agriculture and Fisheries. Advisory leaflet no. 12.

Refinancing of drainage districts. By Geo. R. Boyd. Agricultural Engineering. v. 13, no. 10. October, 1932. p. 258-259. Causes: (1) Construction at times of peak costs and prices. (2) Failure of drainage improvement to do all that was expected. (3) Inadequate drainage statutes, poor management, and dilatory enforcement. (4) Many districts have large areas of cut-over land with resulting difficulty of obtaining settlers. (5) Reduction of farm income. Individual drainage districts must work out own final salvation. Governmental relief temporary.

Vertical drainage with explosives. Wisconsin Agriculturist. v. 59, no. 18. September 3, 1932. p. 13. In sections of country where there are pot holes filled with water which cannot be drained because of surrounding high land, it is practice to make examination of soil by means of soil-auger to discover whether there is porous stratum under tight hard-pan. If this be the case, vertical drainage may be secured quickly, effectively and economically by sub-surface blasting.

Electric service, rural.

Mechanical design of rural lines. By E. V. Seyles. Electrical World. v. 100, no. 11. September 10, 1932. p. 347-349. Economy must lie in longer spans and in revision of ideas concerning factors of safety. Variability of local conditions prevents dogmatism on unit costs.

Electricity on the farm.

Analysis of rural line costs. Electrical World. v. 100, no. 15. October 8, 1932. p. 507-510. Survey of more than 700 miles built during 1930-31, analyzed by electric technical committee on construction standards and costs of rural distribution, Empire State Gas and Electric Association.

Demonstrating applications to the farmer. By E. C. Easter. Electrical World. v. 100, no. 10. September 3, 1932. p. 307. Work carried on by Alabama Power Company.

Electricity cuts silo filling costs. By Ralph R. Parks. Missouri Ruralist. v. 74, no. 3. August 1, 1932. p. 3. Individual equipment replaces big crews. Many uses for motors.

Electrified farms increase. Farm Machinery and Equipment. no. 1784. August 15, 1932. p. 10. Gain of 90,800 in number of farms being served in 1931 over 1930.

Farm use averages three times domestic. Electrical World. v. 100, no. 12. September 17, 1932. p. 376-377. No conspicuous geographical difference, although western figures are generally higher.

Electricity on the farm. (Cont'd)

Farms electrified; push use of energy. Electrical World. v. 100, no. 10. September 3, 1932. p. 291. Report from N.E.L.A. shows number of farm customers to have grown from 177,561 at beginning of 1924 to 698,786 at end of 1931. In 1931 about 48,000 farm customers were added. According to report of Bureau of the Census 845,356 farms or 13.5 per cent of total number of farms in U.S. had electric service as of April 1930.

Progress in rural and farm electrification for the 10 year period 1921-1931. Report of the Rural Electric Service Committee National Electric Light Association. 1932. 13p.

Rural service responds to load development. By E. C. Easter. Electrical World. v. 100, no. 13. September 24, 1932. p. 408. Table gives kilowatt hour sales per farm customer, Florida Power & Light Company, 1930 and 1931.

Southern farmers using more electricity. By E. C. Easter. Electrical World. v. 100, no. 11. September 10, 1932. p. 340. Table I- Increase in rural business - six southeastern states. Table II- Increase of rural business, Alabama Power Company.

Erosion control.

Erosive effects of heavy summer rains in southeastern Washington. By W. A. Rockie and P. C. McGrew. 1932. 8p. Washington Agricultural Experiment Station. Bulletin no. 271.

Engineers and the control of erosion. By Lewis A. Jones. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 234-236. Control of soil erosion is most important problem that faces American agriculture today. And unless controlled will ultimately, and at no distant date, render large areas of cultivated land in U.S. valueless for agricultural uses.

Soil erosion in California: Its prevention and control. By Walter W. Weir. 1932. 45p. California Agricultural Experiment Station. Bulletin no. 538.

Solving the forest and water riddle. By E. I. Kotok. American Forests. v. 38, no. 9. September, 1932. p. 488-491. Recent results of widely conducted experiments are providing abundant facts to show beneficial effects of forests and other plant cover upon stream flow and water conservation.

This waste demon must be stopped. By Arthur M. Hyde. Washington Farmer. v. 67, no. 10. September 8, 1932. p. 3, 18. Alarming destruction of top soil by erosion will lead to nation disaster if unchecked.

Explosives.

Dynamite frees land. By Allister F. MacDougall. Better Farm Equipment and Methods. v. 5, no. 1. September, 1932. p. 6-7. Extension workers stage land-clearing demonstration in Massachusetts.

Extension.

County agricultural agent. By H. W. Hochbaum. 1932. 44p. Multigraphed. U. S. Department of Agriculture. Extension Service. Miscellaneous Extension publication no. 1.

Farm buildings.

Modern farm buildings. By D. N. McHardy. London, Crosby Lockwood and Son, 1932. 227p.

Temperature control index in dairy stable standardization. By J. L. Strahan. Agricultural Engineering. v. 13, no. 10. October, 1932. p. 251-254.

Farm machinery and equipment.

Better tools reduce costs. By E. T. Leavitt. Better Farm Equipment and Methods. v. 5, no. 1. September, 1932. p. 4-5. Modern equipment proves economical besides eliminating much of old time drudgery of harvest time.

Bright prospects for the courageous. Farm Machinery and Equipment. no. 1784. August 15, 1932. p. 5, 18. Continued intensive use of present farm equipment shortens time when it will have to be replaced.

Case announces power rice binder. Implement Record. v. 29, no. 10. October, 1932. p. 26.

Development of the potato harvester. By R. U. Blasingame. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 237-238.

German study of mechanization: Editorial. Implement and Machinery Review. v. 58, no. 689. September 1, 1932. p. 393-394. True interests of agricultural engineering, which are best served by discriminating and instructed use of various implements and machines with object of assisting agriculture rather than revolutionizing it.

Greater efficiency per worker. Farm Machinery and Equipment. no. 1784. August 15, 1932. p. 7. National Industrial Conference Board comments on mechanization of farms.

Inexpensive machine for filling the trench silo. By Ellis G. Discker. 1932. 7p. Alabama Polytechnic Institute. Circular no. 61.

Introduction of farm machinery in its relation to the productivity of labor in the agriculture of the United States during the nineteenth century. By Leo Rogin. Berkeley, University of California Press, 1931. 260p. University of California. Publications in Economics. v. 9. I. Plow, with some consideration of other tillage machinery. II. Wheat production.

Mechanical harvesting in Florida. Facts about Sugar. v. 27, no. 7. July, 1932. p. 291. Under normal conditions mechanical harvester ultimately will be preferred wherever fields are sufficiently level and free from obstructions to admit of power cultivation.

Mechanical versus hand picking. Implement and Tractor Trade Journal. v. 47, no. 20. September 24, 1932. p. 6, 12. Illinois investigation shows many advantages for tractor-drawn units with preference for two-row machines.

Modern way of handling hay. Implement and Tractor Trade Journal. v. 47, no. 19. September 10, 1932. p. 11. One of modern tendencies is chopping hay with silo-filler. Requires approximately one-half storage of loose hay. Much more appetizing feed and avoids costly waste.

New combine enterprise. Farm Implement News. v. 53, no. 28. September 15, 1932. p. 10. Jayhawker Harvester Corp., Kansas City, Mo., has been organized to manufacture Jayhawker combine. Operations will be carried on in plant of Wheatly Bros., Machine Co., at 2505 Broadway.

New farm tool: Editorial. American Fertilizer. v. 77, no. 3. July 30, 1932. p. 12. Potato planter which plants twin rows. Experimental plantings which have now matured show remarkable results, acre yield being increased in some cases as much as 50 per cent. It is failure to adjust ourselves to new order that causes most of troubles of farmers.

New potato harvester. Implement and Machinery Review. v. 58, no. 689. September 1, 1932. p. 401-402. Harvester is designed to follow ordinary chain-driven elevator type of potato digger. Tail of digger is removed and elevator is extended to give added shaking capacity and to elevate potatoes to bagger. Outfit consists mainly of steady travelling picking table, to which is adapted special type of machine grader, combination that provides means for doing several operations in one as number of pickers required varies from two to five, according to condition of soil, weeds present and size of crop.

Operation of farm machinery over terraced land. By C. E. Ramsör. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 231-233. Tractors; plows and listers; planters and drills; cultivators; harrows; disks and rollers; mowers, binders, and rakes; combines.

Soybean harvester needed for South. Implement and Tractor Trade Journal. v. 47, no. 19. September 10, 1932. p. 11. Rank growth and green stalks clog harvesting mechanism and choke separator. Experimental combines built by machinery manufacturers for harvesting soybeans have threshing cylinders as long as cutter bars, and new threshing mechanism which does not pass vines through separator. Tests of these machines are yet to be made.

Weather odds favor corn picker. By E. T. Leavitt. Implement and Tractor Trade Journal. v. 47, no. 19. September 10, 1932. p. 10-11. Chances of losing part of crop are increased by hand harvesting. Many improvements to be found in 1932 mechanical units.

What good equipment does for farmers. By Research department. National Association of Farm Equipment Manufacturers. Farm Implement News. v. 53, no. 28. September 15, 1932. p. 16-17.

Fences.

Durability of fence posts. By J. C. Woolley. 1932. 8p. Missouri Agricultural Experiment Station. Bulletin no. 312.

Fences for every purpose. By Hayden Sanborn Pearson. Country Life. v. 62, no. 2-3. June-July, 1932. p. 58-59.

Floods and flood control.

Maine rivers and their protection from possible flood hazards. 1929. 89p. Main Development Commission. Augusta, Maine.

Forage drying.

Artificial drying of agricultural products. By R. B. Gray, W. M. Hurst and E. D. Gordon. Agricultural Engineering. v. 13, no. 10. October, 1932. p. 260-263. History: First attempts at artificial drying; Importance of drying; Developments; Grain drying; Cotton drying; Forage drying; Cost of artificial forage drying; Research problems.

Frost protection.

Smokiness of oil-burning orchard heaters. By Warren R. Schoonover and F.A. Brooks. 1932. 67p. California Agricultural Experiment Station. Bulletin no. 536.

Heating.

Automatic gas burners. By George C Segeler. Heating, Piping and Air Conditioning. v. 4, no. 7. July, 1932. p. 516-520.

Future heating will simulate nature. By Richard A. Wolff. American Architect. v. 141, no. 2607. May, 1932. p. 60-61.

Tests of convectors in a warm wall testing booth. By A. P. Kratz, M. K. Fahnestock and E.L. Broderick. Heating, Piping and Air Conditioning. v.4, no. 7. July, 1932. p. 502-508. Result of research conducted at University of Illinois in cooperation with A.S.H.V.E. laboratory. Includes part of results from one year's work constituting continuation of general research program devoted to study of heating rooms with various types of direct steam and hot water radiators and convectors.

Panel heating tests being conducted in Great Britain. Heating and Ventilating v. 29, no. 9. September, 1932. p. 26. Extensive investigations into science of heating, ventilating and air conditioning conducted by building research board of the Department of Scientific Research.

Room warming by radiation. By Arthur H. Berker. Heating, Piping and Air Conditioning. v. 4, no. 3. March, 1932. p. 207-214. Physiological considerations; operation of radiation systems; calculation of heat requirements; practical applications.

Study of intermittent operation of oil burners. By L. E. Seeley and J.H. Powers. Heating, Piping and Air Conditioning. v. 4, no. 2. February, 1932. p. 138-142. Result of research conducted at Yale University in cooperation with A.S.H.V.E. Research laboratory and American Oil Burner Association.

Thermostatically controlled master valves as heat controllers for buildings. By F. E. Goetz. 1932. 24p. Colorado Agricultural Experiment Station. Bulletin no. 393.

Total, static and velocity pressure. By A. A. Berestneff. Heating, Piping and Air Conditioning. v. 4, no. 3. March, 1932. p. 195-198. Some of definitions occurring in references, amplified and explained in detail.

Houses.

Bureau of Standards aid home planning and construction. By Henry D. Hubbard. Commercial Standards Monthly. v. 9, no. 4. October, 1932. p. 77-80.

Fireproof steel house may be industry's next big job. By Joseph C. Folsom. Commerce. v. 29, no. 9. October, 1932. p. 24-27, 34, 36. World's Fair industrial arts section will show eight types of homes, several of them factory built. Steel, lumber, and non-metallic minerals to be materials and air treatment, new types of heating and other late household inventions will be shown.

Homes in the country: Editorial. American Builder and Building Age. v. 53, no. 5. August, 1932. p. 12. It is estimated that excess of emigration from cities to country over opposite movement will this year be about million people and will probably be larger next year. If this movement should persist for few years, it would contribute powerfully to restoring balance between agriculture and industry.

Houses with copper walls require no painting. Popular Mechanics. v. 56, no. 5. November, 1931. p. 767. Walls are formed of large plates which support ceiling of beams and have lining of wood as insulating material. Metal walls are formed ready for assembling, and such house can be constructed in twenty-four hours. Easily altered, extended or moved.

Low-cost housing: Editorial. Engineering News Record. v. 109, no. 13. September 29, 1932. p. 386-387. Recognized social need. Offers fertile field for unemployment relief and business stimulation.

Low-cost shelter is timely problem. By L. J. Smith. Washington Farmer. v. 67, no. 11. September 15, 1932. p. 3. Small house to meet present-day economic needs can be built for \$150 cash outlay.

Prefabricated buildings will bring lower costs. By Arthur Tappan North. American Architect. v. 141, no. 2607. May, 1932. p. 66-67, 90.

Starting place. By Lewis E. Welsh. Country Home. v. 56, no. 9. September, 1932. p. 15.

This small farm home is not costly. By L. J. Smith. Washington Farmer. v. 67, no. 14. October 6, 1932. p. 3, 12. Plan devised with view to small outlay and maximum number of conveniences.

Hydraulics.

Analyzing hydraulic models for effects of distortion. By Merrough P. O'Brien. Engineering News Record. v. 109, no. 11. September 15, 1932. p. 313-315. Relation of dimensions in open-channel models important in interpreting results. Results of study on free-overfall model.

Insulation.

How insulation influences fuel consumption. By A. P. Kratz. Domestic Engineering. v. 140, no. 3. August, 1932. p. 111-113.

Insulating to cut your fuel cost. Popular Mechanics. v. 56, no. 5. November, 1931. p. 872-875.

Irrigation.

Farm water measurement. By Mark R. Kulp. 1932. 22p. Idaho College of Agriculture. Extension Division. Extension Circular no. 43.

Increased interest in pump irrigation: Editorial. Western Farm Life. v. 34, no. 15. August 15, 1932. p.4.

Irrigation investigations in young grapefruit orchards on the Yuma Mesa. By G.E.P. Smith, A.F. Kinnison, and A.G. Carns. 1931. 59lp. Arizona. Agricultural Experiment Station. Technical Bulletin no. 37.

Irrigation practice in the Eastern States. By F. E. Staebner. Agricultural Engineering. v. 13, no. 10. October, 1932. p. 264.

Merced irrigation district studies basis of refinancing. Engineering News Record. v. 109, no. 15. October 13, 1932. p. 452-453.

Soybeans under irrigation in Colorado. By D. W. Robertson, Alvin Kezer and G. W. Deming. 1932. 24p. Colorado Agricultural Experiment Stations. Bulletin no. 392.

Land.

Farm land areas determined by weighing cut-out prints. By Joseph J. Bernstein. Engineering News Record. v. 109, no. 13. September 29, 1932. p. 382-383. Much time saved by cutting out sections from blueprinted maps and determining their areas by weighing on sensitive balance. Comparison of weight method with planimeter method resulted in conclusion that former is much more rapid and equally accurate.

New York's land utilization program. By C. H. Ladd. Extension Service Review. v. 3, no. 8. September, 1932. p. 117-118. State land policy; survey of resources; land classified; reforestation.

Lighting.

Interior illumination. By G. H. Stickney and Walter Sturrock. Commercial Standards Monthly. v. 9, no. 3. September, 1932. p. 55-56. Proper illumination results in economics, but depends on adequacy in interior wiring.

Lubrication.

Oiling devices and lubricants for air tools. By James D. Clewer. Engineering News Record. v. 109, no. 15. October 13, 1932. p. 432-434. Recent invention has taken important task of lubricating air tools from hands of operator and made it regular and automatic.

Miscellaneous.

Analysis of the bonding and shearing forces on circular and rectangular reinforced hollow concrete sections. By Gerald J. Gurnersoll. Structural Engineer. v. 10, no. 8. August, 1932. p. 342-352.

Calculating radiation by use of tables. By W. F. Fisher. Heating and Ventilating. v. 29, no. 9. September, 1932. p. 27-31. Ceiling heights other than 9 feet; floors and ceilings; roofs; air change

Miscellaneous. (Cont'd)

Definition of the inch. By H. W. Bearce. Mechanical Engineering. v. 54, no. 10. October, 1932. p. 689-691.

Fan performance and selection. By Henry Mathis. Aeroengineer. v. 8, no. 10. October, 1932. p. 21-25. Disc and propeller fans; Centrifugal fans; Centrifugal fan wheels; Partial backward multi-blade fans.

First report on foreign geographic names. 1932. 113p. United States Geographic board.

Heat engines. By S. H. Moorfield and H. H. Winstanley. London. Edward Arnold & Co., 1931. 287p.

Ingenious mechanical movements. Machinery. v. 39, no. 2. October, 1932. p. 121-123. Mechanisms selected by experienced machine designers as typical examples applicable in construction of automatic machines and other devices.

Knowledge of electrical fundamentals saves costly mistakes. By Milton K. Arenberg. Heating, Piping and Air Conditioning. v. 4, no. 3. March, 1932. p. 199-200. Basic facts which must be kept constantly in mind in selection of electrical equipment.

Natural wind velocity gradients near a wall. By J. L. Blackshaw and F. C. Houghton. Heating, Piping and Air Conditioning. v. 4, no. 6. June, 1932. p. 427-432.

Record earth-pressure testing machine. By Dr. Karl Terzaghi. Engineering News Record. v. 109, no. 13. September 29, 1932. p. 356-369. Precision device installed at Massachusetts Institute of Technology for testing pressure of earth against retaining walls is largest in world. First used in connection with retaining wall design for Fifteen Mile Falls dam.

Selection and care of dairy sires. By M. L. Flack. 1932. 15p. Nebraska Agricultural College. Extension Service. Extension Circular no. 626.

Treadmill for ocean waves to harness power. Popular Mechanics. v. 56, no. 5. November, 1931. p. 707. Look like cleated track of tractor. Cleats are curved paddles on steel belt mounted beyond surf line. Inner surface of belt is lined with teeth and enmeshed with gears connected to individual shafts, which in turn propel main power shaft. This shaft operates battery of air compressors housed above beach line, and compressed air runs dynamos.

Understressing and notch sensitiveness in fatigue. By Prof. J.B. Kohners. Engineering News Record. v. 109, no. 12. September 22, 1932. p. 353-355. "Coaxing" effect of repeated understressing is found greatest when initial stressing is close to endurance limit and may be increased by progressive raising of stress. Notches weaken cast iron less than steel.

Motors.

Development of electrical machinery in the United States. Pt. II. Transformers and motors. By F. D. Newbury and P. L. Alger. General Electric Review. v. 35, no. 9. September, 1932. p. 455-464.

Power by electric motor. By R. H. Rogers. Southern Power Journal. v. 50, no. 10. October, 1932. p. 11-15. pt. 4. Direct current motors.

Painting.

Aluminum paints as protective coatings. By W. B. Roberts. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 236.

Pipes.

Calculating pipe sizes and pressure drops. By G. A. Gaffert. Power Plant Engineering. v. 36, no. 18. October, 1932. p. 708-709. Nomographic chart assists in determining velocities and pressure drops for saturated and superheated steam without reference to table.

Poultry houses.

Floor heating for brooder houses. By Hobart Beresford. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 240. Electric heating elements imbedded in reinforced concrete slabs provide brooder floor which will keep litter dry. Other supplementary heat is necessary however, to maintain proper air temperatures under hover without raising floor temperatures too high or restricting ventilation.

Wet litter in poultry houses. By M. Wayne Miller. Agricultural Engineering. v. 13, no. 9. September, 1932. p. 238-239. One of greatest factors causing wet litter in poultry houses is condensation. Cold floor condenses moisture from air above it and gives no opportunity for moisture in litter to evaporate. Increased ventilation does not solve problem. Insulation increases it. Floor heating does solve it.

Power.

Gaskets and packing for hydraulic power. Heating, Piping and Air Conditioning. v. 4, no. 3. March, 1932. p. 202-203.

Hydroelectric developments and the correlation of hydro and steam power. By F. A. Allner. Mechanical Engineering. v. 54, no. 10. October, 1932. p. 695-699.

Power used on Minnesota farms. By A. J. Schwantes. Farm Implement News. v. 53, no. 28. September 15, 1932. p. 20.

Power plants.

Texas hydro plant built on irrigation canal. Engineering News Record. v. 109, no. 13. September 29, 1932. p. 377-380. Turbines served by double-purpose canal under 81-ft. head. Spillway bypasses excess flow through stilling pool to tailrace.

Public works.

Getting work started through the R.F.C. By Paul Wooten. Engineering News Record. v. 109, no. 12. September 22, 1932. p. 348-349. Outstanding fact is conclusion that more active and complete cooperation by local authorities will hasten creation of employment by grant of construction loans.

Relief act encourages revision in waterworks policy. By Malcolm E. Pirnie. Engineering News Record. v. 109, no. 12. September 22, 1932. p. 336-339. Self-liquidating requirements will stimulate change in method of supporting many public services. Tax rolls will be relieved of numerous items, and

Public works. (Cont'd)

individuals benefiting will pay costs directly in tolls and service charges.

Pumps and Pumping.

Pumps - big and small, rotary and reciprocating - their lubrication. Pt.I.
By Allen F. Brewer. Southern Power Journal. v. 50, no. 10. October,
1932. p. 16-19.

Refrigeration.

Refrigerating data book and catalog. 1st edition, 1932-1933. American
Society of Refrigerating Engineers. 1932. 127p.

Temperature gradient in milk cooled by direct immersion. By Raymond G.
Bressler, Jr., and John E. Nicholas. Agricultural Engineering. v. 13, no.9.
September, 1932. p. 230-231.

Underground refrigerator for the farm. Popular Mechanics. v. 56, no. 5.
November, 1931. p. 879. Under floor of small building, pit 8 ft. square
and $9\frac{1}{2}$ ft. deep is dug. Sides are boarded up with cheap lumber, leaving
12-in. space between earth and boards to be filled with sawdust. Bottom
of pit is covered with $1\frac{1}{2}$ ft. layer of coarse gravel to insure effective
drainage. Floor of ice house should be made of two thicknesses of lumber,
with layer of heavy paper between. Windows are boarded up during summer so
that inside of ice house will be kept as cool as possible. During freezing
weather, water is run into pit, few gallons at time, and allowed to form
ice, building being left open to admit cold. This process is repeated until
solid cake of ice, 8ft. square and over 6 ft. thick, has been formed. Floor
is then replaced and house tightly closed. Such cake of ice will last
throughout summer. Diagram.

Roofs.

Lead head nails seal metal roofs. By George E. Dickson. Better Farm Equip-
ment and Methods. v. 5, no. 1. September, 1932. p. 8-9. Problems
of weather proof roofing construction solved by new economical method of
lead-heading nails.

Rope

Discussion of bending stresses in shaft hoist ropes. Wire Engineering. v.2,
no.2. October, 1932. p. 32-36. Table gives comparison of bending stress
formulas.

Sewage and sewage disposal.

Sewage disposal for the farm home. By A. G. Tyler. 1932. 1p. University
of Minnesota. Agricultural Extension Division. Agricultural Engineering
News Letter no. 6.

Test on sludge beds show best drying depth. By Morris M. Cohn. Engineering
News Record. v. 109, no. 11. September 15, 1932. p. 315-316. Studies
at Schenectady indicate that greatest production of dried sludge per unit
area of bed will be obtained with 10-in. depth when rate of removal is taken
into consideration.

Silos.

Ensilage stored in trench saves silo cost. Popular Mechanics. v. 56, no. 5. November, 1931. p. 869. Experiments conducted by Nebraska Agricultural Experiment Station.

Fix up silo and grain bins: Save time and waste of grain later. By I. W. Dickerson. Farmer. v. 50, no. 15. July 23, 1932. p. 15.

Slat fence emergency silo, how to build and use. Dakota Farmer. v. 52, no. 17. August 20, 1932. p. 407.

Trench silos cut cost. By C. D. Lowe. Southern Agriculturist. v. 62, no. 8. August, 1932. p. 7.

Soils.

Model tests of soil action under footings. By G. I. Pokrowski and N.W. Lalotin. Engineering News Record. v. 109, no. 11. September 15, 1932. p. 309-311. Results of tests at civil engineering high school at Moscow are shown by photographs taken through glass containers of soil movement under piles and various forms of footings.

Storage houses and cellars.

Get all ready for winter: Hints on vegetable storage given by college. Washington Farmer. v. 67, no. 11. September 15, 1932. p. 14.

Home storage of fruits and vegetables. By H. D. Locklin. 1932. 12p. Washington State College. Extension Service. bulletin no. 174.

Vegetable storage. By A.G.B. Bouquet. 1932. 4p. Oregon. Agricultural College. Extension Service. Extension bulletin no. 452.

Sugar beets.

U. S. beet acreage shows increase. Facts about Sugar. v. 27, no. 7. July, 1932. p. 271-272. Revised figures on plantings put total at 809,000 acres. Increase in Michigan and Ohio over 100 per cent. Large decrease in Rocky Mountain states.

Sugar cane

Variety tests of sugar canes in Louisiana during the crop year 1930-31. By George Arceneaux, I. E. Stokes and R. B. Bisland. 1932. 27p. U.S. Department of Agriculture Circular no. 242.

Terracing.

Nichols terrace. By Ellis G. Discker. Progressive Farmer. v. 47, no. 16. October, 1932. p. 10. Gives guide for determining distance between terraces, and terrace grades or fall.

Tires.

Challenge of low pressure air tires on farm tractors. Farm Implement News. v. 53, no. 30. October 13, 1932. p. 19-20, 25.

Tiros. (Cont'd)

Firestone perfects tract or tire. By J. D. Sharkey. Implement and Tractor Trade Journal. v. 47, no. 20. September 24, 1932. p. 7. Low pressure pneumatic is claimed to afford better traction than conventional wheels with spade lug equipment.

Firestone "steals the show" at Big Rock plowing match. Farm Implement News. v. 53, no. 29. September 29, 1932. p. 13.

These rubber tractor tires: Editorial. Farm Implement News. v. 53, no. 30. October 13, 1932. p. 14. Tests under plowed surface conditions have demonstrated that low pressure rubber tires will consume only half as much power to proper tractor as do steel wheels with lugs. Greater opportunity for use, surer it is that tractor will repay its cost.

"Zero-pressure" tires for tractors. Automotive Industries. v. 67, no. 12. September 17, 1932. p. 367. Reduces slippage. Tire consists of all-rubber arch built on slotted steel base for solid-tired wheels. Under load, because there is no air pressure on inside, tire assumes concave tread profile. Use of these tires on tractor wheels makes it possible to greatly lower weight of wheels.

Tractors.

Tractors and soil management. Implement and Tractor Trade Journal. v. 47, no. 21. October 8, 1932. p. 8, 14. Prevention of erosion by terracing and building up of fertility mean use of more power to maintain productivity

Ventilation.

Barn breezes. By Andrew Appleby. Electricity on the Farm. v. 5, no. 10. October, 1932. p. 8-12.

Walls.

Some structural facts about retaining walls. By Harold S. Woodward. American Architect. v. 141. no. 2608. June, 1932. p. 28-29, 90.

Water.

Safety and quality of water still need improvement. By F. H. Waring. Engineering News Record. v. 109, no. 12. September 22, 1932. p. 341-343. Increasing burdens of pollution and structural defects or obsolescence present existing or potential hazards to safety. Higher esthetic quality now demanded by water consumers.

Water heating.

Boston water heating costs are low per person. Electrical World. v. 100, no. 13. September 24, 1932. p. 402. In general operating cost per person ranges between \$.90 and \$1.30 per month. Table gives cross-sectional water-heating costs.

Why not hot water? By J. H. Walker. Heating and Ventilating. v. 29, no. 9. September, 1932. p. 23-26. Control of heat supply; Performance of hot water system; Critical points in circulation cycle; calculation of pipe sizes.

Water supply.

Elimination of tastes and odors of industrial origin from public water supplies. By Mortimer M. Gibbons. Industrial and Engineering Chemistry. v. 24, no. 9. September, 1932. p. 977-982. Tastes and odors not removed by preliminary storage, coagulation and sand filtration, may best be removed by activated carbon. Has selective action in removing taste-producing constituents of wastes and is particularly effective against medicinal odors.

Engine on cultivator lifts water for farm. Popular Mechanics. v. 56, no. 5. November, 1931. p. 775. Well capacity about three barrels per minute. At normal operating speed, three-inch pipe with total length of about 500 feet, was kept full without running well dry.

Method of estimating ground-water supplies based on discharge by plants and evaporation from soil. Results of investigations in Escalante Valley, Utah. By Walter N. White. 1932. 105p. U.S. Geological Survey Water-Supply paper no. 659 A.

Soft water for the home. By A. M. Buswell and B. W. Lehmann. 1932. 16p. Illinois. Agricultural Experiment Station. Circular no. 393.

Supply and distribution facilities are underdeveloped. By G. Gale Dixon. Engineering News Record. v. 109, no. 12. September 22, 1932. p. 339-341. Nature of water-supply business discourages excess capacity and system enlargements are usually made only when they can no longer be postponed. Present facilities would be inadequate for demands of normal times.

Weeds.

Paving garden helps control weeds. By W. G. Kaiser. Agricultural Engineering. v. 13, no. 10. October, 1932. p. 259. Blocks few inches thick and 9 and 12 in. wide cover ground, with rows $1\frac{1}{2}$ in. wide between them. Conserves moisture and controls weeds. In addition, warms soil earlier in season and keeps it warm longer in fall.

Welding.

Arc welding in implement construction. Farm Implement News. v. 53, no. 30. October 13, 1932. p. 32-33. Deere develops method to permit production of wide disk harrows of adequate strength with minimum weight.

Wood.

Strength and related properties of redwood. By R. F. Luxford and L. J. Markwardt. 1932. 48p. U.S. Department of Agriculture. Technical bulletin no. 305.

